

A Recipe For Gold

The story of gold and silver deposition in Waihi

Volcanic violence

Around 20 million years ago volcanoes burst through the landscape around what we now know as Waihi. Tall, steep sided andesite volcanoes formed as the hot lava was thrown out to coat the sides of the volcanoes and the surrounding land. These volcanoes were similar in size and shape to Ruapehu and Ngauruhoe in the central North Island. Volcanic eruptions continued throughout the Coromandel for more than 15 million years.

The mountains wear down

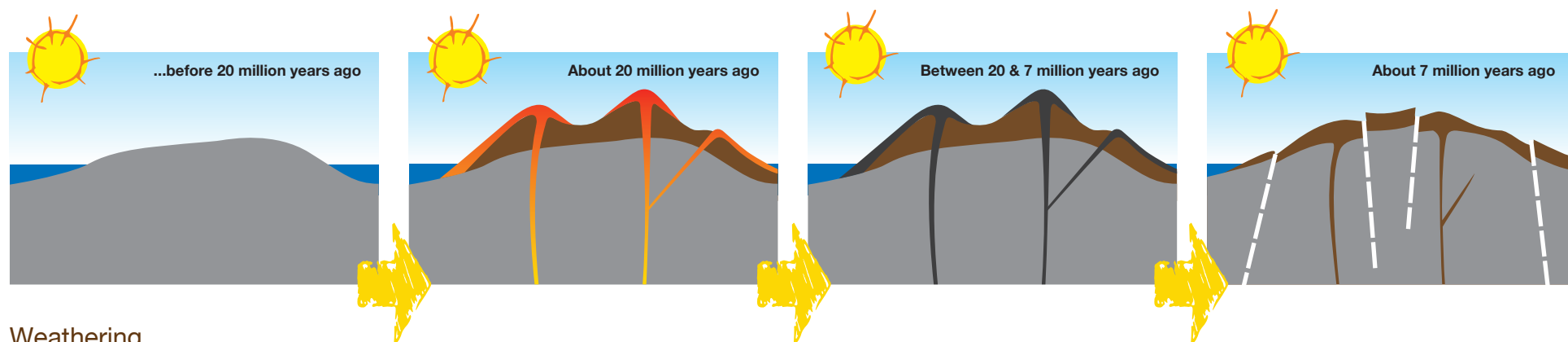
Any rock raised above the ground is subjected to a range of forces that gradually wear it away. Over time the forces of weathering and erosion can reduce mountains to hills. 20 million years of weathering and erosion has taken its toll on the local landscape. It is hard to make out the shape of those ancient volcanoes. Hundreds of metres of rock have been gradually eroded away from the original mountains.

Other forces

Meanwhile, other forces were also working deep within the earth. The landmass of New Zealand was being squeezed and uplifted, helping the mountain building process. This uplift continues today, very slowly pushing up most of New Zealand.

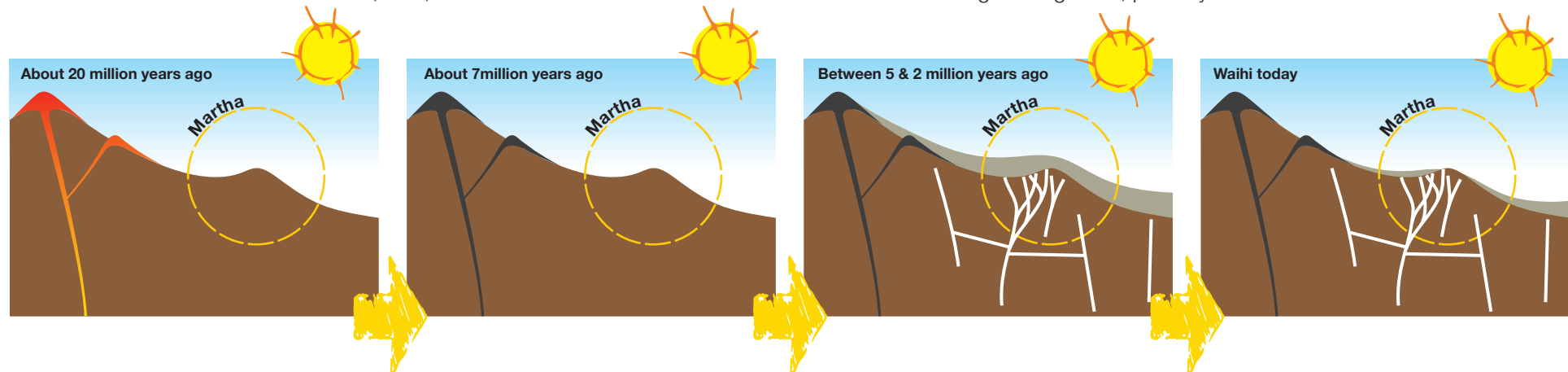
Earthquakes rupture the land

About seven million years ago the Waihi area was violently shaken by many earthquakes. Large deep cracks or fissures appeared in the older volcanic rocks.



Weathering

Following the period of geothermal activity, weathering continued to wear down the mountains and hills. The quartz veins running up through the Waihi area were hard to erode and gradually Martha Hill began to protrude above the surrounding land. What was once deep inside the earth was now close to the surface as a result of the forces of heat, cold, wind and rain. However Martha Hill did lose some of its original height too, possibly about 400 metres.

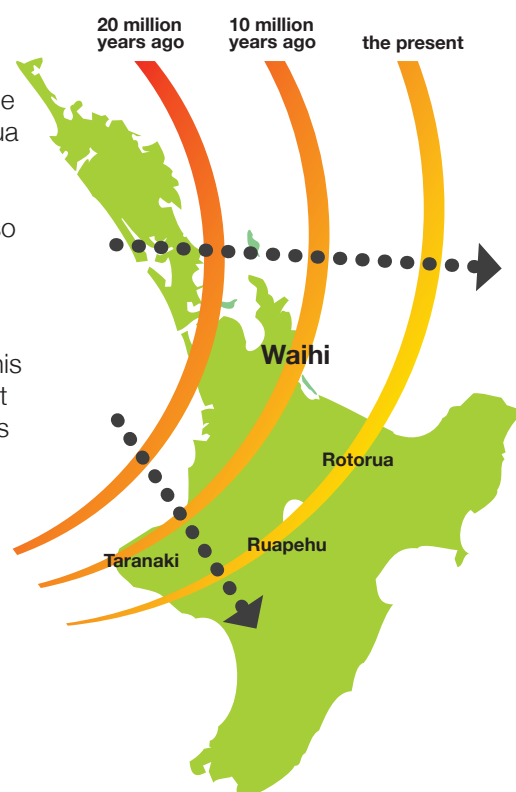


Migrating volcanism

The Waihi landscape was very different seven million years ago. The land was higher, probably by several hundred metres.

Geysers threw boiling, mineral rich water high into the air, mudpools bubbled and hot springs dotted the countryside, very much like Rotorua today. Hot rock far below the ground provided heat energy for those spectacular features and also provided the ingredients for the gold deposit to be formed at Martha Hill.

Over time the volcanic activity in this area dwindled. As the earth's crust moved, the volcanic 'hot spot' was felt through Tauranga, then Te Puke, to be centred around the Central Plateau today.



Geysers, mudpools and gold

Different minerals are deposited at different depths. Minerals that are soluble only at very high temperatures are deposited first far below the surface, while others are very soluble and remain in solution until they reach the surface.

The diagram shows how veins of silica containing gold and silver formed in rock fissures.

These are the quartz veins which are currently being mined at Martha Mine.

